

What is claimed is:

1           1.     A fuel cell system comprising:  
2           a fuel cell subsystem comprising a fuel cell stack adapted to furnish power to a  
3     load;  
4           a battery;  
5           a first circuit adapted to connect the battery to the load when the fuel cell  
6     subsystem substantially delays in responding to a change in the power;  
7           a current sensor to indicate a current through the fuel cell stack; and  
8           a second circuit coupled to the current sensor to monitor cell voltages of the fuel  
9     cell stack, determine the minimum of the cell voltages and prevent the current from  
10    exceeding a maximum threshold current based on the minimum cell voltage.

1           2.     The fuel cell system of claim 1, wherein the first circuit is further adapted  
2     to disconnect the battery from the load when the fuel cell subsystem responds to the  
3     change.

1           3.     The fuel cell system of claim 1, wherein the fuel cell subsystem comprises:  
2           a fuel cell stack adapted to receive a hydrogen flow; and  
3           a fuel processor to produce the hydrogen flow.

1           4.     The fuel cell system of claim 3, wherein the fuel cell subsystem further  
2     comprises:  
3           a controller adapted to monitor the power and regulate a rate at which the fuel  
4     processor produces the hydrogen flow based on the monitored power.

1           5.     The fuel cell system of claim 1, wherein the first circuit is further adapted  
2     to connect the battery to the load based on a fuel cell stack voltage of the fuel cell  
3     subsystem.

1           6.       The fuel cell system of claim 1, wherein the first circuit comprises:  
2           a first diode to couple the battery to the fuel cell subsystem when a stack voltage  
3 of the fuel cell subsystem is near a predefined threshold voltage.

1           7.       The fuel cell system of claim 1, wherein the second circuit comprises:  
2           a voltage regulator adapted to regulate a stack voltage of the fuel cell stack and  
3 limit the current through the stack.

1           8.       A method comprising:  
2           using a fuel cell stack to furnish power to a load;  
3           connecting a battery to the load in response to the fuel cell stack substantially  
4 delaying when responding to a change in the power;  
5           monitoring a current through the fuel cell stack;  
6           monitoring cell voltages of the fuel cell stack;  
7           determining the minimum of the cell voltages; and  
8           preventing the current from exceeding a maximum threshold current based on the  
9 minimum cell voltage.

1           9.       The method of claim 8, further comprising:  
2           disconnecting the battery from the load when the fuel cell subsystem responds to  
3 the change.

1           10.      The method of claim 8, further comprising:  
2           monitoring the power;  
3           producing hydrogen;  
4           regulating a rate of the production in response to the monitoring; and  
5           providing the hydrogen to a fuel cell stack of the system.

1           11.      The method of claim 8, further comprising:  
2           connecting the battery to the load based on a fuel cell stack voltage of the fuel cell  
3 subsystem.

1           12.    The method of claim 8, further comprising:  
2           connecting the battery to the load when a stack voltage of the fuel cell subsystem  
3           is near a predefined threshold voltage.

1           13.    The method of claim 8, further comprising:  
2           using a voltage regulator to regulate a stack voltage of the fuel cell stack and limit  
3           the current through the stack..

1           14.    A fuel cell system comprising:  
2           a fuel cell subsystem adapted to measure a lowest cell voltage and further  
3           adapted to furnish power to a load, wherein the fuel cell subsystem is connected to the  
4           load through a diode;  
5           a fuel processor subsystem adapted to furnish reformat to the fuel cell  
6           subsystem; and  
7           a supplemental power subsystem adapted to furnish power to the load  
8           when the lowest cell voltage drops below a predefined threshold voltage, wherein the  
9           supplemental power subsystem is connected to the load through a diode.

1           15.    A fuel cell system comprising:  
2           a fuel cell subsystem adapted to measure a lowest cell voltage and further  
3           adapted to furnish power to a load, wherein the fuel cell subsystem is connected to the  
4           load through a diode;  
5           a fuel processor subsystem adapted to furnish reformat to the fuel cell  
6           subsystem;  
7           a supplemental power subsystem adapted to furnish power to the load  
8           when the lowest cell voltage drops below a predefined threshold voltage, wherein the  
9           supplemental power subsystem is connected to the load through a diode; and  
10          a controller adapted to monitor the power and regulate a rate at which the  
11          fuel processor produces the hydrogen flow based on the monitored power.

- 1            16.    The fuel cell system of claim 15, further comprising:  
2                    a predefined threshold voltage of  $-0.35$  volts.
- 1            18.    The fuel cell system of claim 15, further comprising:  
2                    a predefined threshold voltage of more than  $-0.4$  volts.
- 1            19.    The fuel cell system of claim 15, further comprising:  
2                    a predefined threshold voltage of more than  $-0.5$  volts.